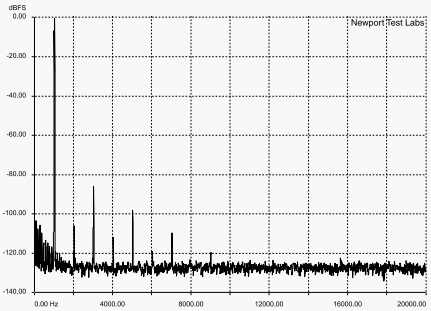
Test Results

Rated with an output of 90-watts continuous per channel into 8Ω, Yamaha's A-S2000 was tested at 103-watts continuous per channel, 20Hz–20kHz by *Newport Test Labs*. As you can see in the tabulated figures, this 20Hz–20kHz rating was the result of the maximum output power at 20kHz. At lower frequencies, the amplifier could deliver fractionally more: 105-watts per channel. The fact that the single-channel-driven and both-channels-driven figures are the same points to the Yamaha's power supply being tightly regulated. Although such tight regulation is fairly unusual, I seem to recall it was a feature on the high-end amplifiers manufactured in Australia by ME.

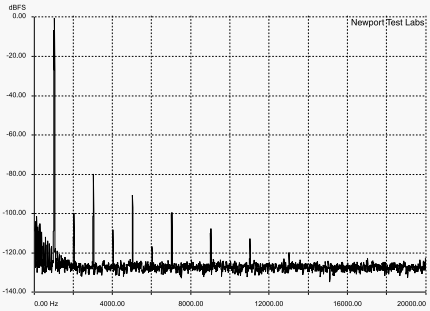
Tested with 4Ω loads, the Yamaha delivered a minimum 170-watts single-channel across the frequency band (with a maximum output of 175-watts at 1kHz), and a minimum 172-watts across the band with both channels driven, with a maximum of 181-watts at 1kHz. That the two-channel figure is higher is interesting, but is likely a combination of the effects of the regulation, the low impedance, variations in the mains power supply and measurement tolerances. Given that the difference is a mere 0.2dB, it's clearly not significant. (Indeed the dBW values for 172-watt and 170-watt figures, when rounded to one decimal place, are identical.)

The frequency response of the Yamaha A-S2000 is not only flat but also extended, stretching from 5.6Hz to 71kHz –1dB, and from 3Hz to 176kHz –3dB. Across the audio band, *Newport Test Labs* measured the normalised response as 20Hz to 20kHz ±0.1dB. You can see this response graphed in *Graph 5*, as the black trace. Also shown on this graph is the Yamaha's frequency response into a load that simulates that of a typical two-way bass reflex loudspeaker. As I'd expect, the response is not as flat as it is into the laboratory test resistor, but it's still very flat, returning a response of 20Hz to 20kHz ±0.3dB. The tone control action (not shown), was conventionally shaped, with good shelving characteristics, and offered boost of 9dB at 20Hz and 8dB at 20kHz, and cut of 10dB at 20Hz and 9dB at 20kHz. There is a very small effect on the output level at 1kHz when the tone controls are engaged, but no more than is usual for a Baxandall design.

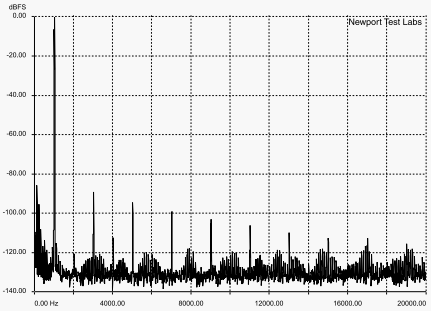
Harmonic distortion was extremely low at all frequencies, and all power output levels, irrespective of output load. *Graph 1* shows distortion at 1-watt into 8Ω and you can see that only the third and fifth components rise above –100dB (0.001%), with the third sitting at –88dB (0.007%) and the fifth just peeking above –100dB. There are no high-order harmonic components above the noise floor,



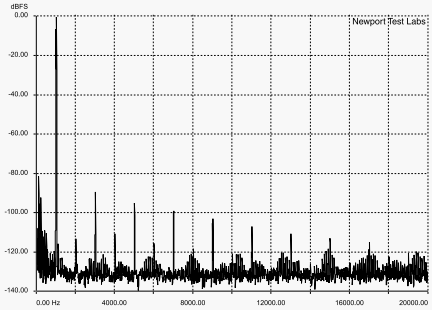
Graph 1: Total harmonic distortion (THD) at 1kHz referenced to 1-watt across an 8-ohm non-inductive load. [Yamaha A-S2000 Int Amplifier]



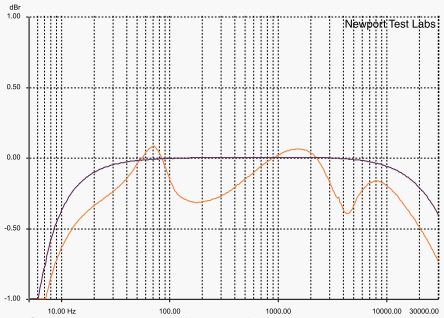
Graph 2: Total harmonic distortion (THD) at 1kHz referenced to 1-watt across a 4-ohm non-inductive load. [Yamaha A-S2000 Integrated Amplifier]



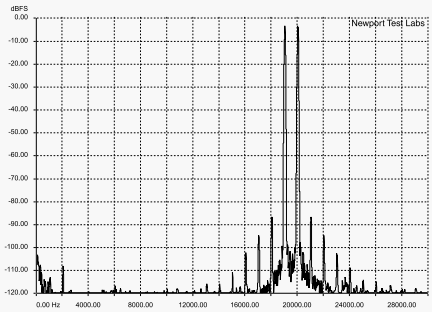
Graph 3: Total harmonic distortion (THD) at 1kHz referenced to rated output (90-watts) across an 8-ohm non-inductive load. [Yamaha A-S2000 Integrated Amplifier]



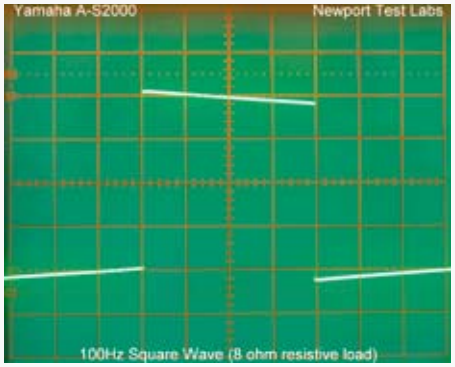
Graph 4: Total harmonic distortion (THD) at 1kHz referenced to rated output (150-watts) across a 4-ohm non-inductive load. [Yamaha A-S2000 Integretaed Amplifier]

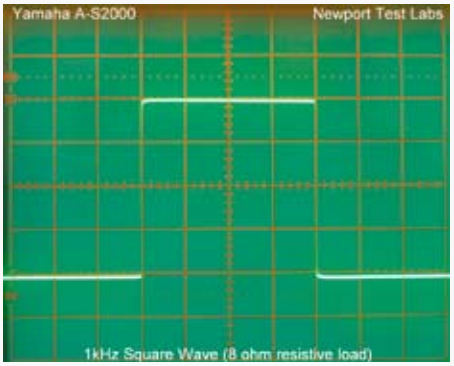


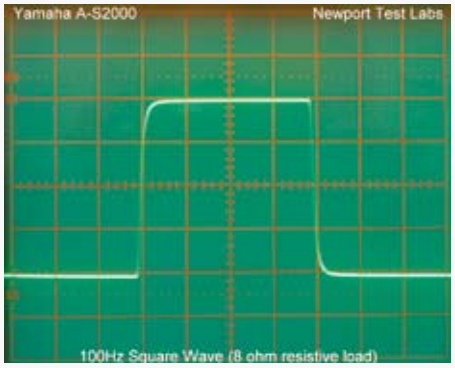
Graph 5: Frequency response of line input referenced to a 1-watt output (at 0dB) across an 8-ohm non-inductive load (Black Trace) and across a combination resistive/inductive/capacitive load representative of a typical two-way loudspeaker system (Red Trace). [Yamaha A-S2000 Integrated Amplifier]

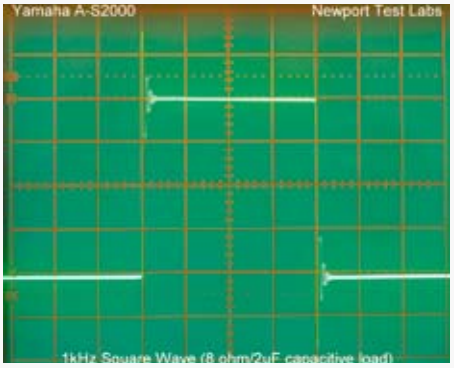


Graph 6: Intermodulation distortion (CCIF-IMD) using test signals at 19kHz and 20kHz, referenced to a 1-watt output (at 0dB) across an 8-ohm non-inductive load. [Yamaha A-S2000 Int Amplifier]









which is at a very creditable –130dB for the most part, though you can see some noise at the extreme left of the graph, which is still for the most part more than 110dB down. Reducing the load impedance to 4Ω saw slight increases in the levels of the odd-order harmonics, with the third-order component coming in at –80dB (0.01%) and the fifth at –90dB (0.003%) but generally, the 'timbral signature' was almost identical, which is excellent. The summed THD+N result at one watt was measured at an excellent 0.005%.

As you can see from *Graph 3* and *Graph 4*, distortion was higher at rated output, into both 8Ω and 4Ω loads, with slightly higher levels of low-order harmonic distortion components and the appearance of low-level high-order components. However once again, almost all distortion components were more than 100dB below reference. The noise floor has dropped further down, as you'd expect, and the very small peaks clustered around the distortion components are a product of the power supply, indicating that it's giving its all. Overall, THD+N at rated output tested at 0.004%.

CCIF-IMD was also excellent, as you can see in *Graph 6*. You can see that the two test signals (at 19kHz and 20kHz) have very small IMD sidebands, but they're almost 90dB down. The most important part of this test—the lack of regenerated difference signal at 1kHz—is nearly 110dB which is a superb result.

Yamaha's use of balanced circuitry seems to have paid off when you look at the signal-to-noise results, because the IHF A-weighted figure came in at 98dB referenced to just one-watt, which is exceptional for an integrated amplifier. Likewise, the unweighted S/N ratio referenced to rated output broke the three-digit barrier, coming in at 101dB, with A-weighting improving this to 108dB. I suspect the balanced circuit also helped with the excellent channel separation figures: 94dB at 1kHz is a terrific result. The 20kHz figure of 70dB is more pedestrian, but more than will ever be required at this frequency. Power consumption was a little higher than I expected it might be—again this might be due to the unusual power supply design—pulling 76-watts from the mains at one watt and a thumping 213-watts when operated flat-out. It even pulls 66-watts when idling with no signal! The lesson here is that if you want to be 'green' and help stop global warming, you should turn this amplifier off when you're not actually using it. With this level of power consumption, it'll come up to operating temperature (and thus optimum playback conditions) very quickly whenever you switch it on.

Steve Holding

Yamaha A-S2000 Integrated Amplifier		**Power Output**				**(Serial #: Y011167VX)**	
Channel	Load (Ω)	20Hz (watts)	20Hz (dBW)	1kHz (watts)	1kHz (dBW)	20kHz (watts)	20kHz (dBW)
1	8Ω	105	20.2	105	20.2	103	20.1
2	8Ω	105	20.2	105	20.2	103	20.1
1	4Ω	170	22.3	175	20.3	170	22.3
2	4Ω	178	22.5	181	22.5	172	22.3

Note: Figures in the dBW column represent the output level, in decibels, referred to one watt output.

Yamaha A-S2000 Integrated Amplifier	**Test Results**	**(Serial #: Y011167VX)**
Test	Measured Result	Units/Comment
Frequency Response @ 1 watt	5.6Hz–71kHz	–1dB
Frequency Response @ 1 watt	3.0Hz–146kHz	–3dB
Channel Separation	102dB/94dB/70dB	(20Hz/1kHz/20kHz)
Channel Balance	0.5dB	@ 1kHz
THD+N	0.005% / 0.004%	1 watt/rated o/p
S/N Ratio (unweighted/weighted)	92dB/98dB	dB re 1 watt output
S/N Ratio (unweighted/weighted)	101dB/108dB	dB re rated output
Input Sensitivity (CD input)	15mV/143mV	(1 watt/rated o/p)
Output Impedance	0.0387Ω	OC = 2.7214V
Damping Factor	206	@ 1kHz
Power Consumption	NA/66 watts	Standby/On
Power Consumption	76 watts /213 watts	1-watt/Rated op
Mains Voltage Variation	236–256 volts	Min–Max